

**Achievement of Market-Friendly Initiatives and Results Program
(AMIR 2.0 Program)**

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Equity, Portfolio Management , Real Estate Practice Exam 2 and Solutions

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Practice Exam -2:

1. Consider the following about the risky portfolio that you manage, and a risk-free asset: $E(r_p) = 11\%$, $\sigma_p = 15\%$, $r_f = 5\%$.
 - a. Your client wants to invest a proportion of her total investment budget in your risky fund to provide an expected rate of return on her overall or complete portfolio equal to 8 percent. What proportion should she invest in the risky portfolio, P , and what proportion in the risk-free asset?
 - b. What will be the standard deviation of the rate of return on her portfolio?
 - c. Your other client wants the highest return possible subject to the constraint that you limit his standard deviation to be no more than 12 percent. Which client is more risk averse?

Following introduction for questions 2 - 5.

Introduction

Suppose that the borrowing rate that your client faces is 9 percent. Continue to assume that the S&P 500 Index has an expected return of 13 percent and standard deviation of 25 percent.

2. Draw a diagram of the CML your client faces with the borrowing constraints. Superimpose on it two sets of indifference curves, one for a client who will choose to borrow, and one who will invest in both the index fund and a money market fund.
3. What is the range of risk aversion for which the client will neither borrow nor lend, that is, for which $y = 1$?
4. Solve problems 14 and 15 for a client who uses your fund rather than an index fund.
5. What fee (percentage of the investment in your fund, deducted at the end of the year) can you charge to make the client indifferent between your fund and the passive strategy?

Following introduction is for the questions 6 - 8

CFA Question - Introduction

Hennessy & Associates manages a \$30 million equity portfolio for the multi-manager Winstead Pension Fund. Jason Jones, financial vice president of Winstead, noted that Hennessy had rather consistently achieved the best record among the Winstead's six equity managers. Performance of the Hennessy portfolio had been clearly superior to that of the S&P 500 in four of the past five years. In the one less favorable year, the shortfall was trivial.

Hennessy is a "bottom-up" manager. The firm largely avoids any attempt to "time the market." It also focuses on selection of individual stocks, rather than the weighting of favored industries.

There is no apparent conformity of style among the six equity managers. The five managers, other than Hennessy, manage portfolios aggregating \$250 million made up of more than 150 individual issues.

Jones is convinced that Hennessy is able to apply superior skill to stock selection, but the favorable returns are limited by the high degree of diversification in the portfolio. Over the years, the portfolio generally held 40-50 stocks, with about 2 percent to 3 percent of total funds committed to each issue. The reason Hennessy seemed to do well most years was because the firm was able to identify each year 10 or 12 issues which registered particularly large gains.

Based on this overview, Jones outlined the following plan to the Wilstead pension committee:

"Let's tell Hennessy to limit the portfolio to no more than 20 stocks. Hennessy will double the commitments to the stocks that it really favors, and eliminate the **remain**-den Except for this one new restriction, Hennessy should be free to manage the portfolio exactly as before."

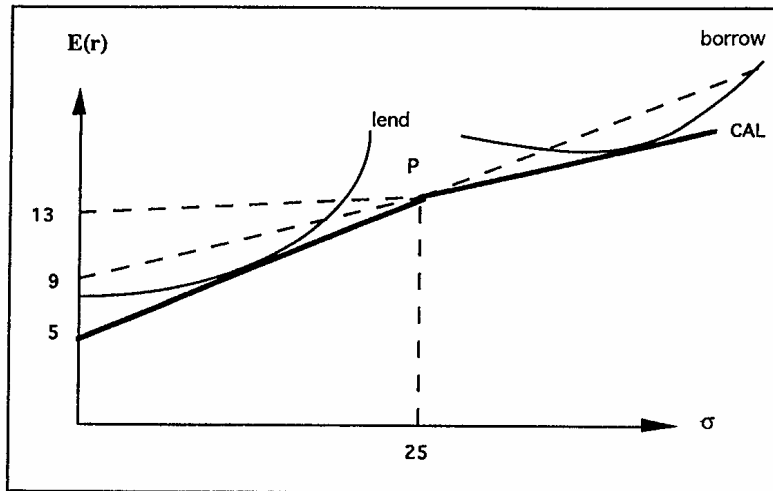
All the members of the pension committee generally supported Jones' proposal because all agreed that Hennessy had seemed to demonstrate superior skill in selecting stocks. Yet, the proposal was a considerable departure from previous practice, and several committee members raised questions. Respond to each to these questions:

6. Answer the following:
 - a. Will the limitations of 20 stocks likely increase or decrease the risk of the portfolio? Explain.
 - b. Is there any way Hennessy could reduce the number of issues from 40 to 20 without significantly affecting risk? Explain.
7. One committee member was particularly enthusiastic concerning Jones' proposal. He suggested that Hennessy's performance might benefit further from reduction in the number of issues to 10. If the reduction to 20 could be expected to be advantageous, explain why reduction to 10 might be less likely to be advantageous. (Assume that Wilstead will evaluate the Hennessy portfolio independently of the other portfolios in the fund.)
8. Another committee member suggested that, rather than evaluate each managed portfolio independently of other portfolios, it might be better to consider the effects of a change in the Hennessy portfolio on the total fund. Explain how this broader point of view could affect the committee decision to limit the holdings in the Hennessy portfolio to either 10 or 20 issues.

Solutions for Practice Exam -2:

1.
 - a. $E(r) = 8\% = 5 + y(11-5)$
 $y = (8-5) / (11-5) = 0.5$
 - b. $\sigma = y\sigma_p = 0.5 \times 15 = 7.5\%$
 - c. The first client is more risk averse, allowing a smaller standard deviation.
- 2.

Assuming $r_f = 5$



For lenders

$$1 \geq y = \frac{100 [E(r) - r_f]}{A\sigma^2}$$

3.

$$A = \frac{100(13 - 5)}{25^2} = 1.28$$

For borrowers

$$1 \leq y = \frac{100 [E(r) - r_f^B]}{A\sigma^2}$$

$$A = \frac{100(13 - 9)}{625} = .64; \quad y = 1 \text{ for } .64 \leq A \leq 1.28$$

4. The graph of 14 has to be redrawn here with $E(r) = 11$ and $s = 15$

$$A \geq \frac{100(11 - 5)}{225} = 2.67$$

$$A \leq \frac{100(11 - 9)}{225} = .89$$

$$y = 1 \text{ for } .89 \leq A \leq 2.67$$

The fee depends on reward to variability ratio.

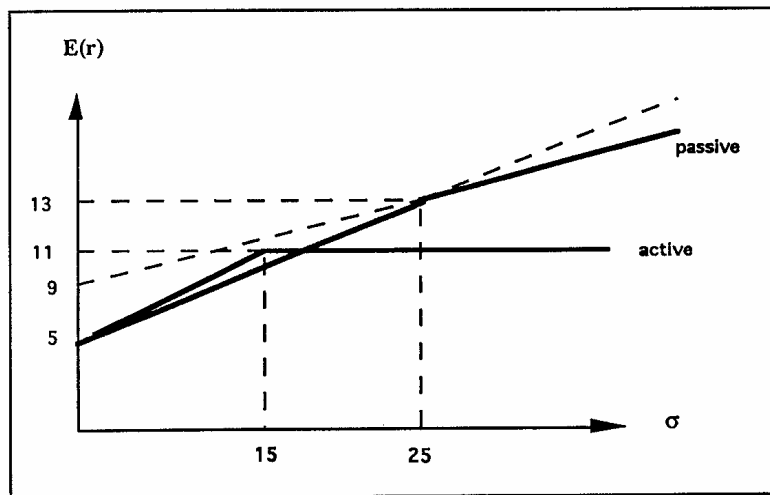
5. For lenders

$$\frac{11 - 5 - f}{15} = \frac{13 - 5}{25} ; \quad f = 6 - \frac{8 \times 15}{25} = 1.2\%$$

For borrowers

$$\frac{11 - 9 - f}{15} = \frac{13 - 9}{25} ; \quad f = 2 - \frac{15 \times 2}{25} < 0$$

The results show that the active portfolio is inferior for borrowers.



- 6.
- Restricting the portfolio to 20 stocks rather than 40-50 will increase the risk of the portfolio.
 - if Hennessey were to manage the restricted portfolio with the objective of minimizing risk the increase in risk would be small. But this will defeat the purpose of the exercise which is stock picking for their mean which attracted the committee's attention in the first place.
7. Risk reduction benefits from diversification are not a linear function of the number of issues in the portfolio. Rather, it is an exponentially decreasing function. Restricting Hennessey to 10 instead of 20 issues would increase the risk of his portfolio by more than restricting the portfolio from 30 to 20.
8. The point is well taken because what the committee should be concerned with is the total risk of their entire portfolio. Since Hennessey's portfolio is only one of six well diversified portfolios and smaller than the average, the concentration in fewer issues could have a sufficiently small effect on the diversification of the total fund. So that unleashing Hennessey on stock picking may be advantageous.